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September 6, 1995

Via Federal Express

Office of the Secretary
Federal Communications Commission
Washington, D. C. 20554

Dear Sir or Madam:

Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415 and 1.419, enclosed herein is an original and nine (9) copies of the Comments of ComTech Associates, Inc.

If you need any additional information, please feel free to call me at the telephone number referenced above.

Sincerely,

Richard S. Wilensky

RSW/nh
A5090502
Enclosure

BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D. C.

In the Matters of		
Rulemaking to Amend Parts 1, 2 and 25 of the Commission's Rules to Redesignate the 27.5 - 29.5 Ghz Frequency Band, to Reallocate the 29.5 - 30.0 Ghz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service, and for Fixed Satellite Services and	§	CC Docket No. 92-297
	§	RM-7872; RM-7722
Suite 12 Group Petition for Pioneer's Preference	§	

To: The Commission

COMMENTS OF COMTECH ASSOCIATES, INC.

ComTech Associates, Inc. ("CTA"), through undersigned counsel, hereby submits its Comments in response to the above-referenced Third Notice of Proposes Rulemaking and Supplemental Tentative Decision, released July 28, 1995 (the "Third Notice"), affecting the 27.5 - 29.5 Ghz frequency range ("28 Ghz Band").

SUMMARY OF COMMENTS

1. CTA supports the use of competitive bidding in the 28 Ghz Band to award frequency concessions within the local multipoint distribution service ("LMDS"), fixed-satellite service ("FSS") and mobile satellite service ("MSS") services. For FSS and MSS proposals, this should apply to orbital slots when mutually exclusive applications for the slots are submitted.

2. CTA supports the Commission's findings that LMDS service providers require 1 Ghz of spectrum in order to offer distinct and/or combined competitive voice, data and video services in either analog or digital formats.

3. CTA supports the Commission's proposed band plan in Paragraph 45 of the Third Notice, and believes it should be adopted in order to expedite the 28 Ghz proceeding.

DISCUSSION

1. With respect to the public issue priorities specified in the Second Notice, CTA believes that making available a full 1 Ghz of spectrum to LMDS service providers will satisfy two very important public interest concerns. First, terrestrial use of the 28 Ghz Band will enable the widespread deployment of low-cost broadband telecommunications in multiple markets. This opportunity will ensure a diversity of service providers and increase the likelihood that small business and minorities will participate in the provision of such services. Secondly, the diversity of services available over LMDS range from one-way video to broadband two-way voice, video, and data. These flexible and diverse service offerings are permitted because of the unique LMDS system configurations currently available from equipment vendors. It is consistent with Congressional intent and Commission policy to allocate 1 Ghz of bandwidth to such an extraordinarily spectrally efficient technology.

2. CTA agrees with the Commission's tentative conclusion in Paragraph 36 of the Third Notice that the 40 Ghz band is not suitable for LMDS as proposed in this docket. CTA acknowledges however, that if 40 Ghz equipment is developed on an economical basis , certain high-cost terrestrial services may be supportable in the 40 Ghz band in the future.

3. CTA concurs with the Commission's tentative conclusion in paragraph 43 of the Third Notice that co-frequency sharing between NGSO/FSS or GSO/FSS

systems and LMDS systems is not feasible. CTA believes that sharing arrangements as proposed in the Bellcore study will place unnecessary technical and financial burdens on small LMDS operators. Additionally, the technical uncertainty surrounding the inability to adequately field test the necessary conditions resulting from multiple service providers in the 28 Ghz Band will introduce business and financial uncertainty and make raising capital for service providers more difficult. Again, these burdens will fall more heavily upon smaller potential operators.

4. As set forth in Paragraph 47 of the Third Notice, CTA supports the Commission's intent to permit, on a secondary basis, the operation of GSO/FSS or NGSO/FSS systems for the purpose of providing limited "gateway" type services in the 850 Mhz from 27.5 Ghz to 28.35 Ghz. However, CTA believes that a precise definition of "gateway" services must be adopted. While in any case the primary operation of LMDS in this band will be protected by the secondary designation for the "gateway" services, proliferation of satellite earth stations in the band beyond the levels envisioned by the Commission in proposing the limited "gateway" services is likely unless a definition is adopted. A combination of an allowable density and a description of "gateway" function is desirable.

5. CTA does not support the proposed addition of a new section 21.1019 of the Commission's rules (Appendix B, Third Notice, Proposed Rule Amendments to 47 C.F.R. Part 21), which would prohibit the operation of subscriber transmitters in the 29.1 - 29.25 Ghz band. CTA believes it will be possible to permit LMDS subscriber traffic in the 150 MHZ of spectrum shared with MSS feeder links with no adverse impact on the MSS feeder links. Further, CTA believes that it is not necessary that LMDS subscriber transmitters terminate transmissions if not properly oriented. Such "interlock "between the hub and subscriber transmitter is not necessary and will only serve to drive up equipment cost.

Given that LMDS licensees will pay for the use of the 150 MHZ of spectrum which they share with MSS feeder link stations (which will not pay for the use of the spectrum), CTA believes that MSS feeder link stations should be required to operate at a minimum elevation angle of 12 to 15 degrees. This will facilitate the operation of LMDS subscriber transmitters in the band shared with MSS feeder links with no adverse impact on the MSS feeder links. Analyses conducted during the Negotiated Rulemaking Proceedings demonstrated that above elevation angles of 12 degrees, the operations of MSS feeder links were effectively immune to any interference from the terrestrial LMDS due to geometry. Moreover, given the flexibility afforded the MSS operators, who can operate up to eight feeder link earth station complexes in the

continental U.S., restriction of MSS feeder link operations to elevation angles above 12 degrees should have minimal impact on the feeder link planning for the MSS.

Furthermore, CTA believes that the interference-to-noise ratio established by MSS proponents as a basis for interference analyses between LMDS and MSS feeder links during the Negotiated Rulemaking Proceeding was unnecessarily conservative and should be relaxed. The interference-to-noise ratio at the satellite receiver which underpins the rules proposed in Appendix B of the Third Notice was -13 dB. If the interference-to-noise ratio criterion is relaxed to -6 dB, the corresponding change in the receiver operating point for the satellite receiver (the true measure of system performance) is less than one(1) dB. This change (0.97 dB) is a small fraction of the excess power margin on the MSS feeder link of 4.3 dB. Thus, allowing a 7 dB shift (from -13 dB to -6 dB) of interference-to-noise ratio "absorbs" less than one(1) dB of a 4.3 dB margin, even at an operating angle of 10 degrees. At a minimum operating angle of 12 to 15 degrees, as CTA proposes, the impact on the MSS feeder is even less significant.

CTA proposes that the values in the proposed new Section 21.1020 (Appendix B, Third Notice, Proposed Rule Amendments to 47 C.F.R. Part 21) be established as follows:

Climate Region 1:	-16 dBWi/MHZ-km^2
Climate Region 2:	-18 dBWi/MHZ-km^2
Climate Region 3, 4, 5:	-19 dBWi/MHZ-km^2.

These values represent a 7 dB shift from those proposed in the Third Notice and utilize less than one dB of the 4.3 dB margin in the link budget for the MSS feeder links. Any imposition of a more restrictive limit in "spectral area density" will create a conflict between build-out requirements and MSS sharing criteria.

6. CTA does not believe that provision should be made for contingency band plans, as discussed in Paragraph 66 of the Third Notice. First, all of the proponents of the different 28 Ghz service schemes are either US based or part of international consortiums who filed in the US proceeding. It is highly unlikely that new services with any realistic chance of deployment will be proposed at WRC-95. Secondly, a contingency band plan would only weaken the US's negotiating position at WRC-95. CTA strongly urges the Commission to adopt the proposed bandplan for the 28 Ghz proceeding as provided in Paragraph 45 of the Third Notice as the U. S. proposal for WRC-95.

7. The Commission's conclusion in Paragraph 77 of the Third Notice that LMDS will be used for the competitive provision of multi-channel video services is correct. However, LMDS will be used in many different ways in different market situations. LMDS can be deployed in the following manners: as a stand-alone, multi-cell, all microwave, broadcast analog or digital video service; as a video service with individual transmitter cells linked by existing fiber optics; as a two-way video, data, and telephony service whose cells are connected by microwave or fiber optics; as a "last-mile" application for any of the above-mentioned services delivered by a myriad of service providers. In summary, LMDS is an extraordinarily flexible technology that can be configured uniquely, and thus efficiently, on cell by cell and operator by operator basis. LMDS is a necessary technology that will facilitate the entry of new companies in the market for telecommunications services, including multi-channel video delivery.

8. CTA believes that grant of 1 Ghz of spectrum to LMDS operators is both necessary and advisable. Since many LMDS proponents plan to deploy analog video services in competition with existing service providers, LMDS will require 1 Ghz of spectrum in order to offer 50 TV channels. The Commission should note that analog technology provides extraordinary signal quality, reliability, and enough channel capacity for diverse service offerings. The Commission should also note that many customers in many markets will not demand enough channels to warrant digital technology for some time. Additionally, the Commission should recognize that all telecommunications service providers, whether they are wireline or wireless, will have roughly the same compression technology available to them and that service capacity will increase proportionally for all technologies as compression technology is applied over a given bandwidth. Thus, the availability of digital technology will not change the bandwidth requirements of LMDS service providers and should eliminate any competitive concerns raised in Paragraph 78 of the Third Notice. In order for LMDS to remain competitive in the current analog environment and when digital technologies become widespread, 1 Ghz of bandwidth at 28 Ghz for LMDS is necessary.

9. Although LMDS is perhaps unique in allowing one service provider to offer a multitude of services, each of the proposed LMDS uses will face competition from entrenched and well capitalized competitors. Therefore, the Commission should be more concerned that the LMDS industry will be able to survive against such existing competition than the issue raised in Paragraph 79 of the Third Notice that one LMDS provider per market will have an unfair competitive advantage. If LMDS is ultimately successful in the market and is found to have a competitive advantage over

other service providers, the Commission would be warranted in allocating additional spectrum to the service.

10. Notwithstanding CTA's support for a full 1 Ghz of bandwidth per licensee, in certain specific instances licensees may require alternative increments of bandwidth. CTA support the flexibility of disaggregation and the benefits that might accrue to license holders as the LMDS technology evolves. However, most service operators will require 1 Ghz. In recognizing the diverse range of services and regulatory regimes any given service operator could be subject to, CTA advocates that the Commission license one service provider with 1 Ghz while permitting disaggregation of the spectrum. This will permit large companies with specific needs to address their requirements flexibly without inspiring anti-competitive bidding strategies that might result from multiple LMDS licenses in smaller bandwidth increments. Additionally, individual companies should be allowed the maximum flexibility to disaggregate any amount of spectrum they choose, not just an arbitrary amount of 425 Mhz or 150 Mhz.

However, in the event that LMDS licenses are disaggregated, the successor licensees should be distinct from the original licensee while still remaining subject to the Commission's rules regarding the eligibility of owning LMDS spectrum and fulfilling build-out requirements. Successor licensees created by disaggregation should be afforded substantial regulatory flexibility. For example, if an incumbent service provider were to sell spectrum to a new service provider who planned to offer multi-channel video services or private Internet access, the new service provider should be allowed to choose a regulatory regime that is distinct from the spectrum's previous owner and that suits its individual needs. However, were that new licensee to use part, or all, of the original service provider's infrastructure, that new licensee should be subject to the most stringent build-out requirements applicable to either the original or successor licensee.

In situations where Designated Entity ("DE") license holders disaggregate spectrum to another DE, the Commission should only ensure that the acquiring DE currently qualifies under the Commission's established rules at the time of the FCC auction. In the event that a DE disaggregates spectrum to a non-DE, the non-DE acquirer should be required to pay the difference between what the DE paid and what the payment would have been without the DE credit to the Commission on a per Household basis per MHZ (assuming the original 1 Ghz license). This additional payment to the Commission should cover any bidding credits, government financing, and any other DE preferences.

CTA supports the Commission's proposal to permit disaggregation of spectrum by LMDS licensees, but believes that the Commission should specify in any rules governing disaggregation that the disaggregated spectrum can be used only to provide one or more LMDS services. Likewise, and given that the LMDS licensees will be paying for spectrum rights through auction, CTA believes that the Commission should prohibit any potential "backdoor" methods of gaining spectrum for LMDS. For example, the Commission should prohibit any satellite service licensee, whether GSO/FSS, NGSO/FSS, or MSS feeder link, from establishing any LMDS or other terrestrial service in the spectrum for which it has been licensed. Should a satellite licensee, regardless of whether the satellite licensee in question obtained its license by auction, determine that sharing with LMDS services is feasible, then sharing rules should be established by the Commission and the spectrum should be auctioned for LMDS. Under no circumstances should point-to-point fixed service (except LMDS intercell links) be placed in the 27.5 Ghz to 30.0 Ghz band.

11. In response to the Commission's request for comments in Paragraph 81 of the Third Notice, there should be no restrictions on the amount of spectrum individual LMDS licensees may own. Service operators should be able to own licenses in multiple BTAs.

12. CTA supports the Commission's conclusion to license the LMDS spectrum according to BTAs as defined in the *1995 Commercial Atlas and Marketing Guide* published by Rand McNally. These service areas are of a manageable size for small businesses and will increase the likelihood that rural areas will receive service more quickly.

13. CTA supports geographic partitioning while strongly encouraging the Commission to adopt rules similar to CTA's comments in Paragraph 10 above. In cases where geographic partitioning is permitted, the Commission should ensure that newly created LMDS licensees conform to existing build-out requirements within their service areas and spectrum payments in accordance with their eligibility during the spectrum auctions. It should be noted, however, that CTA strongly urges the Commission to adopt transfer rules that would relieve the transferor of any regulatory or other burdens associated with the newly created license. LMDS licensees should not be in the regulatory enforcement business.

14. CTA agrees with the Commission's conclusion in Paragraph 95 of the Third Notice that individual operators should be allowed to bid for spectrum under the auspices of a regulatory structure that most accommodates their planned service

offerings. The Commission should permit and encourage flexibility in this area. However, CTA does not believe that it is necessary for bidders to elect their regulatory treatment prior to the auctions, since auction conditions may require an operator to make adjustments to anticipated service offerings. CTA believes that auction winners should be required to notify the Commission of their proposed regulatory status within a reasonable period immediately prior to the initiation of service. This would make it easier for operators to adjust during auctions and ease the FCC's regulatory burden prior to the auctions. The Commission recognized as much in the First Notice, and CTA believes that the flexibility afforded operators as described in the First Notice is necessary.

15. CTA does not believe the Commission should preclude any particular industry, including local exchange carriers, from bidding on LMDS spectrum. CTA feels that the presence of established telecommunications companies in the field will help to drive equipment costs lower while also raising the acceptability of the technology in the marketplace.

However, CTA strongly encourages the Commission to adopt faster build-out requirements for companies, whether they are telephone, cable TV, or MMDS operators, who win LMDS licenses that cover any part of or any area immediately adjacent to their existing service areas. CTA proposes that the Commission apply a variation of the build-out requirements proposed in Paragraph 117 of the Third Notice. CTA proposes that incumbent service providers who win LMDS licenses that cover any part of or any area immediately adjacent to their existing territory be required to make service available to 40% of the population of the BTA within three years of the license grant. CTA also proposes that the licensee should make service available to 70% of the population within six years from the license grant. The definition of what constitutes "service" should also be broader with respect to incumbent service providers than with respect to companies not operating in the service area. These build-out requirements are modest compared to the advantages incumbent service providers will reap from their existing operations. In order to make LMDS open and available to as many participants as possible while ensuring against anti-competitive behavior, CTA strongly urges the Commission to adopt CTA's proposed build-out requirements for incumbent service providers who are awarded LMDS spectrum.

16. CTA supports the Commission's proposed rules restricting the transfer and assignment of DE licenses contained in Paragraph 108 of the Third Notice. However, CTA believes that Designated Entities should be able to sell or transfer licenses, without restriction, after the seventh year of the license term.

17. CTA supports the proposed build-out requirement in Paragraph 117 of the Third Notice that LMDS licensees make service available to a minimum of one third of the population of their geographic service areas within five years from license grant and two thirds within ten years from grant. These build-out requirements are appropriate for LMDS license winners that do not currently offer similar service in, or immediately adjacent to, the BTA in a potential LMDS application. With regard to such service providers, CTA recommends more stringent rules requiring that service be made available to 40% of the population of the BTA within three years from the license grant and service be made available to 70% of the population within six years from the license grant.

With regard to measuring compliance with these requirements, CTA proposes that "service availability" be defined as being within the range of the coverage of at least one LMDS cell, where coverage is determined by the nominal radius of the cell, measured from the hub location, for clear air propagation on a line-of-sight basis.

18. CTA supports the Commission's conclusion in Paragraph 118 of the Third Notice that standards that will facilitate coordination between geographically adjacent LMDS systems and between LMDS and MSS feeder link facilities where they share spectrum are the only coordination standards required.

19. CTA agrees with the Commission's view that licensees should have control over their own facilities within designated service areas and be responsible for minimum service performance standards and interference levels within their own systems. Competitive forces will be sufficient to maximize service performance standards and minimize interference levels within their systems in the absence of detailed technical rules regarding limits on EIRP, power flux densities, system frequency stabilities, or spectral efficiencies of modulation schemes. As the Commission has acknowledged, LMDS services are likely, based on the versatility of the LMDS technology, to evolve toward a wide array of service types and approaches. Technical service rules would only serve to suppress the development of desirable market alternatives.

20. CTA supports the Commission's proposal in Paragraph 120 of the Third Notice to require LMDS licensees to coordinate with each other to avoid interference at service area boundaries. This process, without imposing the requirement that any particular methods be used to accomplish interference mitigation, will be efficient and provide LMDS operators with the necessary system engineering flexibility to provide services as the market demands.

There should be no maximum power flux density (PFD) level at the service area boundary set at this time. LMDS systems, given the ability to re-use frequency in every cell, accomplish a minimization of interference at cell boundaries independent of whether they are within a single operator's service area or at the boundary of two operators' service areas. Interference at a service area boundary to a given operator which does not experience unacceptable interference within its own service area should result in the burden of interference mitigation on the interfering system.

LMDS subscriber stations will employ highly directional antennas. These antennas provide a far more effective means for isolation and interference rejection at service area boundaries than a PFD limit. Moreover, a PFD limit that protects one design against interference may not be sufficient to protect another. Because of the typically low population densities at the boundary areas of BTAs, the likelihood that any unacceptable interference would occur at service area boundaries is small from the outset. In summary, CTA believes coordination between system operators is the preferred approach to interference mitigation.

21. CTA supports the Commission's view in Paragraph 121 of the Third Notice that the employment of only orthogonally-polarized signals in LMDS is desirable and will advance the coordination process. CTA supports a requirement that linear, orthogonally polarized signals be employed in the LMDS. This requirement would provide isolation between systems and cells and mitigate any interference at service area boundaries with proper coordination. Additionally, since LMDS signals from within the interior of a service area may have an impact on MSS feeder links or other satellite systems, orthogonally-polarized signals should be required throughout the service area as well as at the service area boundaries.

22. In Paragraph 122 of the Third Notice, the Commission proposes a limit on LMDS transmitter EIRP of -52 dBW/Hz rather than to -18 dBW/Hz (based on a bandwidth of 20 MHZ) that is the maximum EIRP in the 28 Ghz Band under current Commission rules for point-to-point links. CTA does not support the Commission's proposed EIRP limit of -52 dBW/Hz for hub and subscriber transmitters in the LMDS. As is the case with any proposed PFD limit, any EIRP limit is unnecessary. The proposed limit would restrict the flexibility of LMDS designs. Many LMDS designs have been proposed and others may develop which satisfy mitigation requirements but depend on EIRP levels above the proposed -52 dBW/Hz limit. Additionally, methods for mitigating interference at service area boundaries may involve directional antennas which increase EIRP but concurrently suppress undesired interference. Current technology allows EIRP levels above -52 dBW/Hz.

The Commission has proposed that the -18 dBW/Hz EIRP limit would continue to be applied to intercell connecting links in the LMDS. CTA supports this proposal and also supports the proposed 20 MHZ measurement bandwidth. The EIRP, measured over any 20 MHZ bandwidth in the intercell links, should not exceed -18 dBW/Hz.

23. CTA does not support the Commission's proposed EIRP limit of -52 dBW/Hz for LMDS transmitters in Paragraph 123 of the Third Notice. Imposing any limits outside the bands proposed for co-primary use of LMDS and MSS feeder links is unnecessarily constraining. This limit does not provide LMDS system operators with sufficient flexibility and adequate power to meet their needs which include, among other needs, compliance with build-out requirements separately proposed in this Third Notice and the need to maintain flexibility to offer competitive, two-way telephony and data services that the versatile LMDS technology allows.

The Commission has proposed to adopt a 0.001% frequency tolerance for LMDS equipment. CTA does not support this proposal. While such a requirement may be appropriate and economically practical for hub transmitters, it is not appropriate for subscriber stations. CTA questions whether any "spectral efficiency" regulations, which may include frequency tolerance or modulation spectral efficiency requirements, are needed for spectrum that is licensed by competitive bidding. While greater spectral efficiency is always achievable using more complex and expensive equipment, the Commission has, in the past when establishing new services, imposed its judgment as to the proper tradeoff between spectral efficiency and equipment cost and complexity. When the spectrum is auctioned to establish LMDS services, the licensees will have the economic incentive to make the needed tradeoff between equipment cost and spectral efficiency. There is no need for any modulation spectral efficiency or frequency tolerance regulation

LMDS subscriber stations must be designed to be available at competitive prices. As the Commission has observed, the proposed 0.001% frequency tolerance is "within the current state-of-the-art," but it cannot be achieved at the necessary low cost for LMDS subscriber equipment. Further, LMDS subscriber stations will be designed to operate at much lower power levels than hub stations. The Commission has traditionally permitted lower power stations to employ a lower frequency stability. CTA proposes that the Commission exempt LMDS subscriber stations with per-carrier output power below 500 milliwatts from any frequency stability requirements, or in the alternative retain the current Part 21 requirement of 0.03% frequency tolerance for subscriber stations.

24. In Paragraph 124 of the Third Notice, the Commission proposes to require a 1.0 bps/Hz spectral efficiency requirement for LMDS. CTA believes that no such requirement is appropriate for LMDS due to the competitive bidding process for awarding LMDS licenses. License winners can be relied on to employ the appropriate type of digital modulation for services that require it. Moreover, the frequency re-use efficiency of LMDS (frequency re-use in every cell) is a much more significant factor in considering the overall "spectral efficiency" of LMDS than is the modulation efficiency. Imposition of a 1.0 bps/Hz modulation efficiency requirement could stunt the development of low-cost LMDS systems and may preclude the use of some direct sequence or other spread spectrum communication techniques, which may play an important role in LMDS.

In any case, the LMDS systems are inherently more efficient, from the standpoint of frequency re-use, than any satellite systems proposed for the 28 Ghz Band. While LMDS can reuse its allocated spectrum tens of thousands of times in the U.S., proposed satellite systems, including Hughes Spaceway and Teledesic, are limited to only tens or, at best, a few hundred reuses of the spectrum in the U.S. Consequently, even if less-efficient modulation schemes are chosen by LMDS, the LMDS "spectral efficiency" will always greatly exceed that of such satellite systems.

CTA believes that the efficiency standards adopted by the Commission for the Private Land Mobile Radio Services reaffirming efforts are not appropriate for LMDS. These standards mandate a minimum modulation efficiency standard of 0.768 bps/Hz, but the are not developed for the LMDS system architectures. Unlike the Private Land Mobile Radio Services, which generally employ frequency only once in a metropolitan area, LMDS will support many separate reuses of a channel within a metropolitan area. With equal modulation efficiency, LMDS could then have a "spectral efficiency" measured over a metropolitan service area that is fifty or more times that of the PLMRS. For these reasons, any simple "spectral efficiency" standard for LMDS based on bps/Hz is inappropriate. If any standard is needed at all, it should be one that characterizes the true efficiency with which the scarce public spectrum resource is employed by the LMDS.

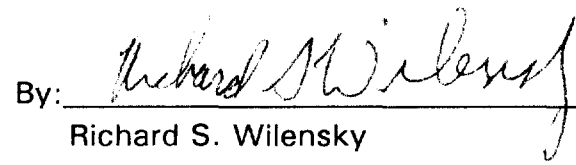
25. CTA agrees with the Commission's conclusion in Paragraph 141 of the Third Notice not to employ combinatorial bidding in conjunction with simultaneous multiple round auctions for which there are minimum bidder activity thresholds. Given the number of BTAs and likely participants, it would be difficult for small operators to determine the likelihood of winning any particular market.

26. CTA believes that LMDS proponents and the Commission have acknowledged the need for 1 Ghz of spectrum for each LMDS service provider. CTA urges the Commission to adopt bidder activity rules that assume only one license covering 1 Ghz per service area and which establish the number of households covered as the activity criteria. For example, bidders would declare their eligibility solely in terms of households. For example, in *Stage Two*, a bidder would have to be active on 80% of the households for which it is eligible in the current round.

27. LMDS operators and equipment suppliers have advocated, and the Commission has recognized, that 1 Ghz is spectrum is necessary in order to provide diverse telecommunications services. Therefore, bid deposits, bid increments, and other former references to MHZ/Pop should reflect a one (1) Ghz standard. CTA proposes that the Commission use a bid deposit of $0.08/Household and adjust the remaining auction rules accordingly. Initial bid deposits of $0.08/Household would still exceed the initial deposits in the PCS proceedings while keeping the barriers to entry low.

Respectfully submitted,

COMTECH ASSOCIATES, INC.

By: 

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Its Attorney

September 7, 1995